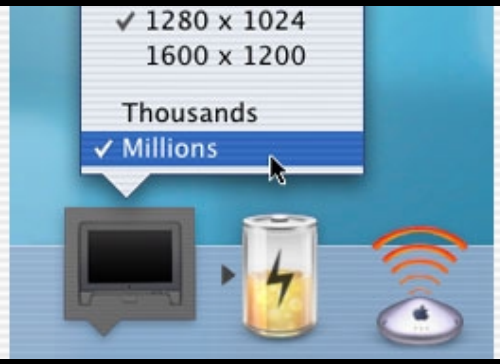
Session 202

FireWire
Mac OS X Overview



Greg Mullins
Technology Manager

FireWire on **100%** of Apple Products

	Consumer	Pro
Desktop		
Portable		

FireWire Hardware Overview

- All have 400 mbps interface; 2 ports on desktops, 1 on portables
- All provide cable power, 6-pin connector(s), Open HCI, and 1394a

FireWire in Mac OS X

- Services and driver support level is equal to Mac OS 9.1
  - Built-in DV driver for QuickTime applications
  - DV capture, export, and Device Control
  - Built-in Mass Storage driver for disks, MO, CD-ROM (etc.)

Comparing Mac OS 9 and Mac OS X Drivers

	Mac OS 9	Mac OS X
Driver Description	In driver's code fragment	Bundle
Scheduling	Synchronous & Asynchronous	Synchronous & Asynchronous
Programming	C	C++ subset Object oriented
Driver Framework	I/O Specific	I/O Kit

What's Been Happening

- New peripherals in every category
- More than 60 peripherals shipping
- More than 100 announced
- Lots of storage!

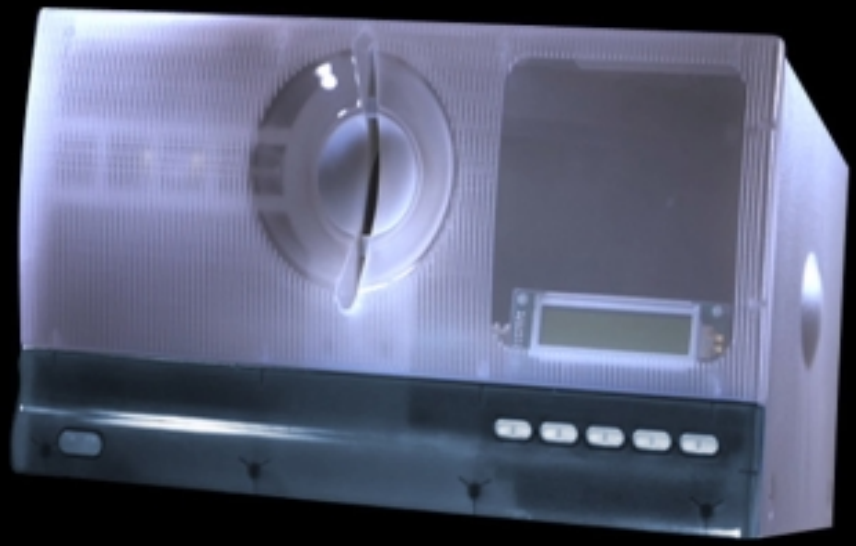
New FireWire Devices

LACIE

VST

New FireWire Devices

New FireWire Devices



New FireWire Devices

UMAX PowerLook 1100

Epson Expression 1600

When to Go FireWire

- USB maxs out at approximately 1MB/sec
- Often a user has several devices connected reducing the bandwidth to each device
- Go to FireWire for devices operating at ≈700 –800K/sec and faster

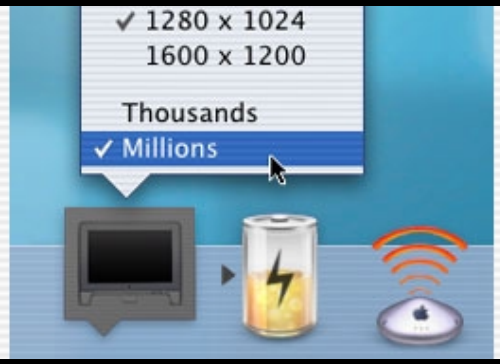
Digital Hub and FireWire

- The Macintosh is the center of the digital hub
- FireWire is a connectivity for this hub
- Devices will play in this arena by supporting FireWire
- Applications will play by supporting FireWire devices
- Devices and Applications benefit greatly from supporting FireWire
- Customers investments gain value

Performance Demo

Eric Anderson
Greg Mullins

FireWire Technology Details



Eric Anderson
Manager, FireWire Software

Serial Bus—IEEE 1394

- FireWire is an Apple trademark
- Serial Bus
  - Serial: Longer distances; friendly cables
  - Bus: Broadcast; no routing—cheap and simple

FireWire Progress

- 1394 Open HCI and 1394a-2000 in all products
- Cable Power in all products (6W or more)
- 100, 200, and 400 mbps in all products
- Boot from FireWire in all products
- Target Disk Mode in all products

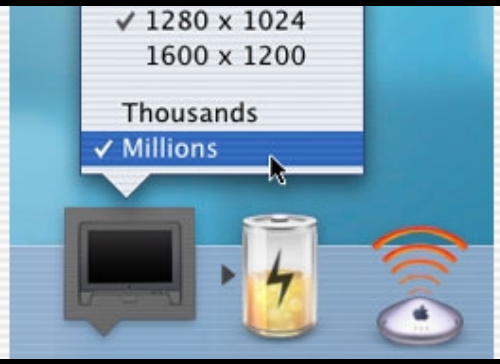
TDM—Target Disk Mode

- Like SCSI Disk Mode—use Mac as FireWire disk
- All current products
  - Implemented in Open Firmware
  - Hold down T key when booting
- Need FireWire 2.3.3+ on other Mac

TDM Demo

Eric Anderson

IEEE 1394b



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IEEE 1394b

- IEEE 1394b is coming
- 800 and 1600 mbps
- Long-haul (50+ meters) on optical fiber
- High-performance Beta Mode
- P1394b standard passed ballot; is in final edit

1394b Cables

- New 9-pin copper connector
  - Same general size as 6-pin connector
  - Individual grounds for twisted pair shields
  - Better signal quality: up to 1600 mbps
  - Bilingual ports are compatible with old devices
    - 9-pin to 6-pin cable
    - 9-pin to 4-pin cable

Using the 9-pin Connector

- If you have a 1394b PHY
- Only if you have a 1394b PHY
- This is important—Your customers will be badly confused if you do this wrong
  - Do not put the 1394b connector on a 1394a PHY
  - Do not put 1394a connectors on a 1394b PHY

1394b Backwards Compatibility

- Changes are in the PHY
- New 1394b devices can work with old hardware and software—just not as fast
- Old devices and software can work with new 1394b devices—as fast as they always have

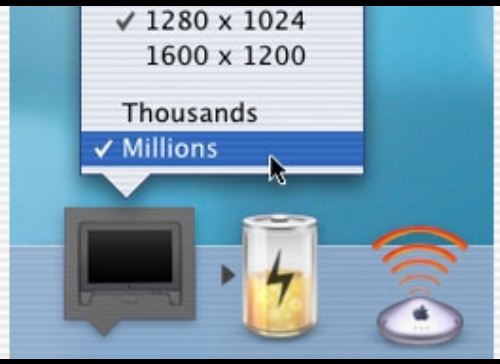
Software Changes for 1394b

- Drivers and Applications: None
- Core FireWire services: Very few

1394b and Optical Fiber

- Optical Fiber and 1394b can reach 50+ meters
- This is not for everyone, or every device
  - Devices with fiber only cannot be directly connected to older computers
- Use hubs to connect fiber
  - 9-pin copper connector on one side
  - Fiber connector on the other side

FireWire Resources



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Resources Available

- FireWire SDK
  - **http://developer.apple.com/hardware/FireWire/Developer_Info.html**
- Free FireWire mailing lists for Technical support
  - Developer FireWire questions: **firewire@apple.com**
  - Technical FireWire questions: **firewire@isg.apple.com**

Things to Do

- Make use of Bus Power
  - iBook and PowerBook G4: 6 Watts
  - iMac: 8 Watts
  - Power Mac G4 and G4 Cube: 15 Watts
- Take advantage of the multihost topology
  - Scanners
  - Printers
- Work with 8–30V as per 1394a

Things to Do

- Use the standard 6-pin connector only
- Use the 400 Mbps PHY for most devices
- Use 2 or 3 connectors on large devices
- Use unique serial number (“GUID”) in every device
- Don’t use “Minimal ROM” format (vendor ID only)

Things to Do

- Use the ‘FireWire’ name and logo (free license for name and logo usage)

- Use the ‘Mac’ logo (free license for logo usage)

Related Sessions

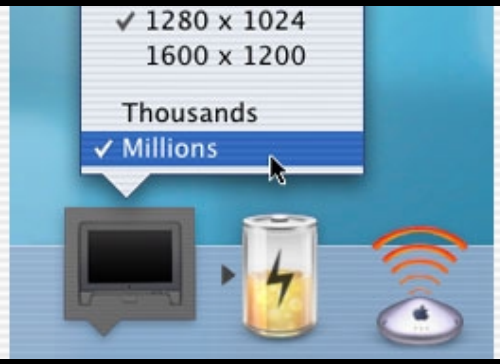
206 FireWire In-Depth: Programming Details and Mac OS X	Civic **Wed., 2:00pm**
FF108 Feedback Forum: FireWire and USB Tell us what you think	Room J1 **Thurs., 2:00pm**
FireWire Plugfest: Plug in devices, lots of beer	Apple Campus **Thurs., 7:00pm**

Who to Contact at Apple

Greg Mullins (firewire@apple.com)
FireWire (& USB) Technology Manager
Worldwide Developer Relations
gmullins@apple.com

Craig Keithley
FireWire (& USB) Technology Manager
Worldwide Developer Relations
keithley@apple.com

Q&A



Greg Mullins
FireWire (& USB) Technology Manager
gmullins@apple.com

http://developer.apple.com/events/urls.html

WWDC

Worldwide Developers Conference 2001